

# Enhancing Adaro's Transformation Strategy for Business Diversification: The Aluminium Smelter Project

Mohammad Effendi and Utomo Sarjono Putro

## ABSTRACT

Climate change has become a global concern, and at the 21<sup>st</sup> Conference of Parties (COP 21) held in Paris in 2015, participating countries agreed to phase out fossil fuels and replace them with renewable energy to achieve Net Zero Carbon Emissions by 2060. Adaro Energy Indonesia (AEI) is a coal (Fossil Fuel) producing company, and the company has prepared a business diversification to a non-coal business. The first step is business diversification for the Aluminium Smelter project. This paper focuses on enhancing Adaro's transformation strategy for its ongoing business diversification efforts, specifically the Aluminium Smelter Project (Adaro, 2023). It explores the current state of Adaro's transformation, identifies areas for improvement, and provides strategic recommendations to strengthen the transformation strategy. The assessment uses Michael Porter's Five Forces theory for market analysis, the PESTLE theory for external scanning analysis, and the Organizational Change Management theory for organisation analysis. These theories together are used to capture Adaro's ideal transformation strategy conditions. SWOT and Resource-Based View (RBV) theories are applied to evaluate existing AEI's organisational strengths. By comparing the ideal transformation strategy conditions with the current situation of AEI, areas that require enhancement are identified. By refining this strategy, the author is confident that Adaro will successfully navigate the business diversification process and capitalize on the opportunities presented by the Aluminium Smelter Project.

**Keywords:** Aluminium Smelter project, areas that require enhancement, business diversification, existing AEI's organizational strength, ideal transformation strategy.

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## I. INTRODUCTION

Climate change has become a global concern for all countries around the world. At the Conference of Parties 21 (COP 21) meeting in Paris in 2015, participants from 195 countries agreed to keep the global temperature increase below 1.5° Celsius. The excessive greenhouse effect causes the temperature to increase. One of the gases with significant influence is carbon dioxide (CO<sub>2</sub>), emitted from burning fossil fuels, including coal used in steam power plants. During the COP 21 meeting, member countries agreed to reduce carbon dioxide (CO<sub>2</sub>) emissions, and this commitment was documented in a document called Nationally Determined Contribution (NDC). Each country is obligated to develop and implement strategies to reduce or eliminate the use of fossil fuels and replace them with Renewable Energy sources to achieve Net Zero Carbon emissions. With this commitment, the use of thermal coal for power plant use will be phased out, and the demand for coal will gradually decrease over time.

PT Adaro Energy Indonesia Tbk. is a publicly listed company whose integrated operation is from mining activities to delivering coal to the port, known as "Pit to Port." AEI also owns and operates coal-fired power plants using coal as fuel for its use and as an Independent Power Producer. Since going public in 2008, AEI has achieved excellent operational

and financial performance, providing positive confidence to its shareholders. However, as of the time of this research, AEI's sales and net profit are still heavily reliant on coal sales. See Table I below for AEI performance for the last five years.

With a global commitment to move away from fossil fuels, the demand for coal is anticipated to decrease over time (Arif, 2022, p. 15) potentially impacting AEI's financial performance. Therefore, the shareholders have agreed that AEI should diversify its business beyond coal. The first step in AEI's diversification effort is constructing and operating the Aluminium Smelter Project.

## II. BUSINESS ISSUE

Adaro Energy Indonesia has a strong commitment to sustainable mining practices and environmental stewardship. The company has implemented a range of initiatives aimed at reducing its environmental impact, including reforestation programs and efforts to reduce greenhouse gas (GHG) emissions, such as the use of Solar Power Plant, the development of biodiesel fuel, and the rehabilitation of watersheds and other environmentally friendly programs. Despite the environmental stewardship performed by Adaro Energy Indonesia, the company is encountering challenges to

TABLE I: AEI PERFORMANCE FOR THE LAST 5 YEARS

Performance Metric	Year				
	2018	2019	2020	2021	2022
Revenue (million US dollars)	3,620	3,457	2,535	3,993	8,102
Cost of revenue (million US dollars)	-2,410	-2,493	-1,958	-2,223	-3,449
Gross profit (million US dollars)	1,210	964	577	1,770	4,653
Net income, million US dollars)	478	435	159	1,028	2,831
Coal production (million ton)	55.0	58.0	54.53	52.7	62.88
Sales volume (million ton)	54.39	59.19	54.14	51.58	61.37

continue to serve and grow its business to align with the

Government of Indonesia (GOI) effort to meet the country’s Net Zero Carbon Emission (NZE) 2060 goals on a broader spectrum with global energy transition. This circumstance has developed the vision of a sunset era in the coal industry. “We officially launched the three business pillars of Adaro on our 30th anniversary, but the thoughts and process that went into it were from several years of work and research. The business pillars of Adaro are now divided into Adaro Energy, Adaro Minerals, and Adaro Green” (Adaro 2022 Annual Report, 2023, p. 42)

Recognizing this future situation, AEI’s shareholders have decided to diversify the company beyond coal. In the first diversification stage, AEI will venture into the Aluminium Smelter business, leveraging its organizational strengths to enter an industry without prior experience. For the new Aluminium Smelter business, together with its business partner, AEI plans to invest approximately USD 2.1 billion for a stage 1 project at a capacity of 500 K TPA of Aluminium finished goods (Adaro, 2023, p. 313).

This paper focuses on enhancing Adaro’s transformation strategy for its ongoing business diversification efforts, specifically the Aluminium Smelter Project. It explores the current state of Adaro’s transformation, identifies areas for improvement, and provides strategic recommendations to strengthen the transformation strategy. The assessment uses Michael Porter’s Five Forces theory for market analysis, the PESTLE theory for external scanning analysis, and the Organizational Change Management theory for organization analysis. The three theories together are to capture Adaro’s ideal transformation strategy conditions. SWOT and Resource-Based View (RBV) theories are applied to evaluate AEI’s existing organizational strengths. Areas that require enhancement are identified by comparing the ideal transformation strategy condition with the current situation of AEI. The findings of this study can further improve the current transformation strategy and provide an implementation plan for its enhancement. By incorporating the recommendations from this research, the author is confident Adaro will successfully navigate the business diversification process and capitalize on the opportunities presented by the Aluminium Smelter Project, as outlined by AEI’s top management.

### III. LITERATURE REVIEW

Five theories influenced the present research, which are Michael Porter’s Five Forces, PESTLE, and the theory of Organizational Change Management, SWOT, and the Resource-Based View. The following subsections will discuss each of them.

#### A. Michael Porter’s Five Forces

Michael Porter’s Five Forces theory (Porter, 1980, 1987) is used to assess the capability of AEI and its business partner to enter the new Aluminium Smelter business by analyzing 5 elements of the business. Porter developed this theory to help corporate strategies tackle issues related to competition (Kapanowsk, 2020). “Porter believed that profits extend to other forces such as customers, new entrants, substitutes, and suppliers” (Kapanowsk, 2020, p. 43). See Fig. 1 for a depiction of the theory.

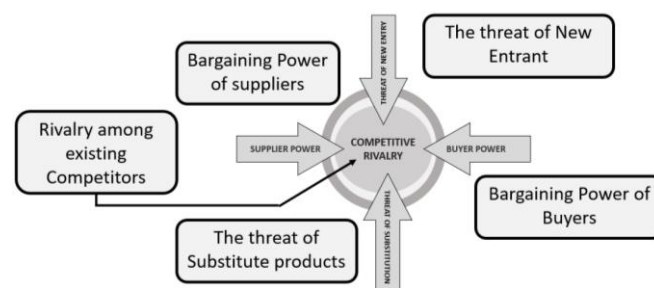


Fig. 1. Michael Porter’s Five Forces.

#### B. PESTLE

PESTLE theory (Alanzi, 2018) is used to analyze the external environmental response when AEI mobilizes the Aluminium Smelter project. The Aluminium project, which has an annual capacity of 500 K Ton per annum, is a major undertaking that necessitates substantial project funding and government support.

“The purpose of the PESTLE analysis is to make you look around and see what is happening in the broader economic and business environment. All Projects are part of a larger system, the economy. Doing a PESTLE analysis helps you look at all important factors that might affect the success or failure of your project”. (Alanzi, 2018, p. 3). See Fig. 2 for a depiction of the theory.

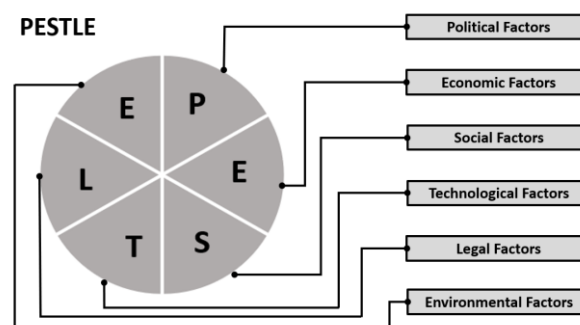


Fig. 2. PESTLE.

C. Organizational Change Management

5 critical steps in the change management process theory (Miller, 2020) are used to analyze the readiness of the organization to face the management of change.

“Change management is the process of guiding organizational change to fruition, from the earliest stages of conception and preparation, through implementation and, finally, to resolution” (Miller, 2020, para 7).

Based on the AEI situation, the author expands from 5 to 7 critical steps as seen in Fig. 3 for a depiction of the theory.



Fig. 3. Organizational change management.

D. SWOT

SWOT analysis theory (Gurel & Tat, 2017) is used to analyze the AEI’s internal strengths and weaknesses as well as external opportunities and threats. Based on this analysis, the study will provide a summary of the existing conditions of AEI in venturing into new business diversification.

“The next phases of the strategic management process are external and internal analysis, also called SWOT Analysis. By conducting an external analysis, an organization identifies the critical threats and opportunities in its competitive environment” (Gurel & Tat, 2017, p. 994). See Fig. 4 for a depiction of the theory.

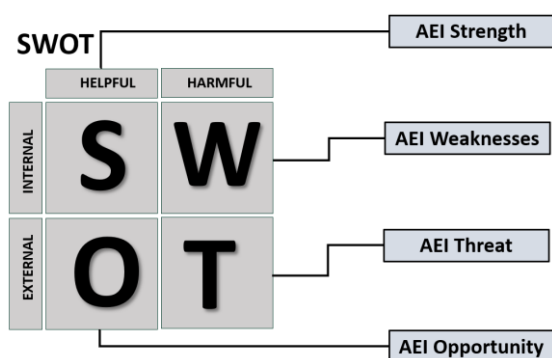


Fig. 4. SWOT.

E. Resource-Based View (RBV)

RBV theory (Jurevicius, 2021) analyzes both the tangible and intangible strengths of AEI. The tangible and intangible strengths will then be further evaluated using a Heterogeneous and Immobile screening, and further refined through the Value, Rarity, Imitability, and Organization (VRIO) framework to determine the company’s competitive advantage. The RBV will also analyze AEI’s organizational

readiness to transform into a new Aluminium Smelter Project. This study uses all the company’s strengths that are required to support AEI’s diversification in the Aluminium Smelter project. “The resource-based view (RBV) is a model that sees resources as key to superior firm performance. If a resource exhibits VRIO attributes, the resource enables the firm to gain and sustain a competitive advantage” (Jurevicius, 2021, para 1). See Fig. 5 for a depiction of the theory.

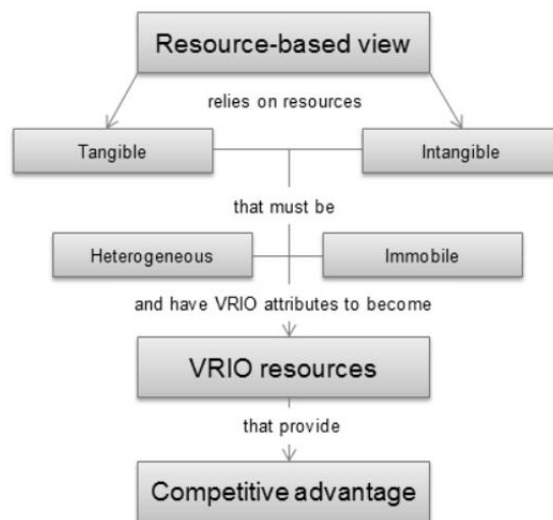


Fig. 5. Resource-based view (RBV).

IV. METHODOLOGY

As the problem has been identified, the research is more to find the solution to the problem. The methodology is described in Fig. 6 below.



Fig. 6. Research methodology.

A. Research Questions

AEI has taken the initiative to diversify its business into a new Aluminium Smelter project, though this is an area that AEI has never been there before. Therefore, this research focuses more on the settlement of the issue that AEI is facing. It begins with the following research questions:

- 1) What is the missing component that can enhance the existing Adaro’s Transformation Strategy for Business Diversification: The Aluminium Smelter Project?
- 2) What is the implementation plan for this enhancement in the transformation strategy?

B. Conceptual Framework

The first step of the conceptual framework is to capture the ideal condition for Adaro’s Transformation Strategy for the

Aluminium Smelter Project. The condition is based on the analysis of Michael Porter’s Five Forces Theory, PESTLE theory and Organization Change Management theory. See Fig. 7 below for the Ideal Condition for Adaro’s Transformation Strategy.

The second step is to capture the existing condition of Adaro concerning its business diversification to the Aluminium Smelter Project. The condition is based on the SWOT and RBV analysis. See Fig. 8 for Adaro’s existing condition in Transformation in the Aluminium Smelter Project.

The third step is to compare Adaro’s ideal condition for the Transformation Strategy (Fig. 7) and Adaro’s existing conditions concerning the Transforming Strategy (Fig. 8). From this comparison, the Transformation Strategy Enhancement can be identified and when this enhancement has been defined the next step is to create an Implementation Plan to execute the proposed enhancement.

The fourth step in the methodology is *Collecting Data*, which will be explained in the Data Collection Method section.

The fifth step is the *Analysis and the Proposed Enhancement*. These are explained in the Results section.

The final step is the *Conclusion and Recommendations*, which are explained in the Conclusions section.

V. DATA COLLECTION METHOD

The data and information are collected from Primary Sources and Secondary Sources. The data from Primary sources are obtained through semi-structured interviews. The process of collecting data and information follows the methodology shown in Fig. 9 below.

Qualitative data is analyzed using a thematic analysis approach, while quantitative data is analyzed using Excel programming. A mixed-methods approach will also be used to integrate the qualitative and quantitative data by comparing the findings, identifying converging, or diverging patterns, and drawing overarching conclusions. Another crucial aspect is the selection of respondents for the interview. The selected respondent represents their experience and the position they are holding for the related questions. Table II shows the selected respondents.

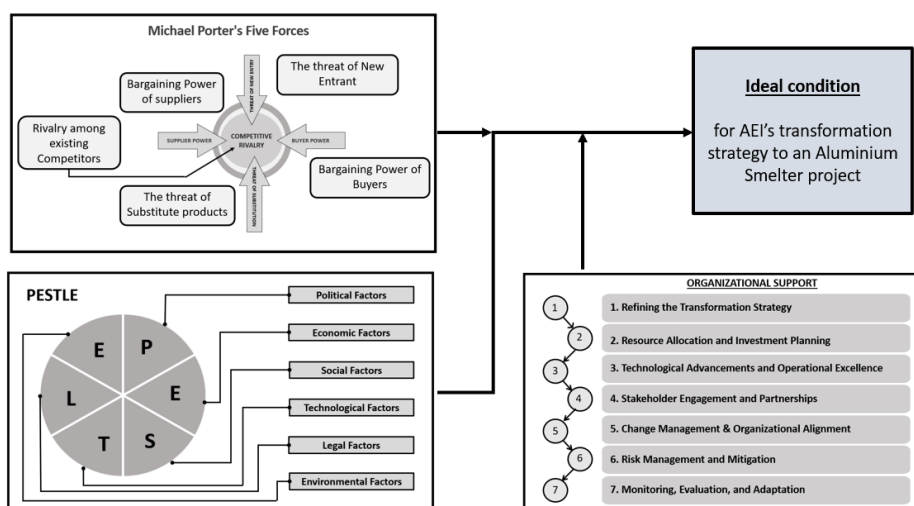


Fig. 7. Adaro’s ideal condition for transformation strategy.

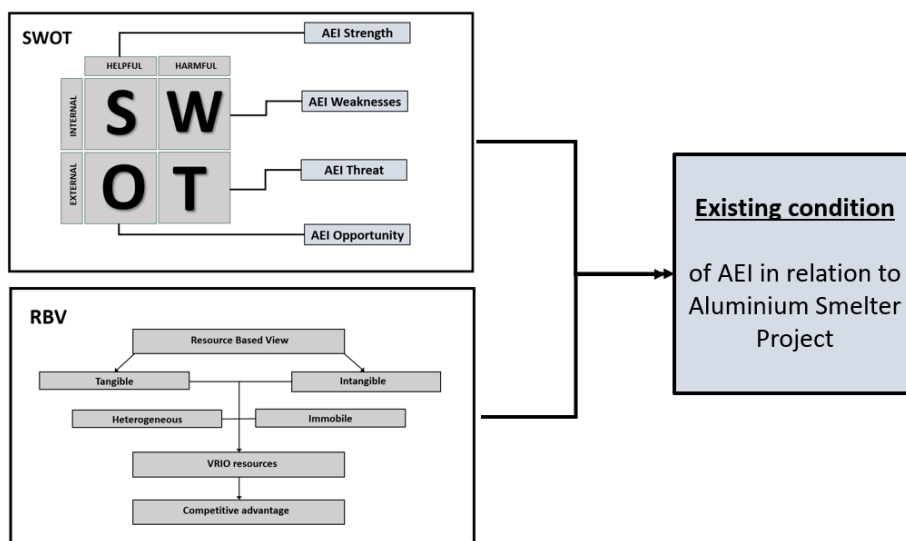


Fig. 8. Adaro’s existing condition concerning the Transformation Strategy.

TABLE II: RESPONDENTS FOR THE INTERVIEW

No	Question Areas	Respondent
1.	Aluminium Smelter operation	Expert in Aluminium Smelter operation with more than 40 years of experience
2.	Government representative	Special Staff to Minister of Ministry Energy & Resources Mineral (MEMR) who has experience as Director General in the Ministry of Industry, President Commissioner of PT Indonesia Asahan Aluminium (INALUM) 2017 – 2021.
3.	Overall Adaro Energy Indonesia's strategic investment and diversification	President Director PT Adaro Energy Indonesia Tbk. (AEI).
4.	Overall Aluminium Smelter business	President Director PT Adaro Mineral Indonesia Tbk. (AMI).
5.	Overall Financial matters	Chief Finance Officer PT AEI Tbk.
6.	Overall Human Resources (HR) issues	HR Director PT AEI Tbk.
7.	Overall Aluminium Smelter Project	President Director PT Kalimantan Aluminium Industry (KAI).

Source: INALUM (<https://www.inalum.id/en>).

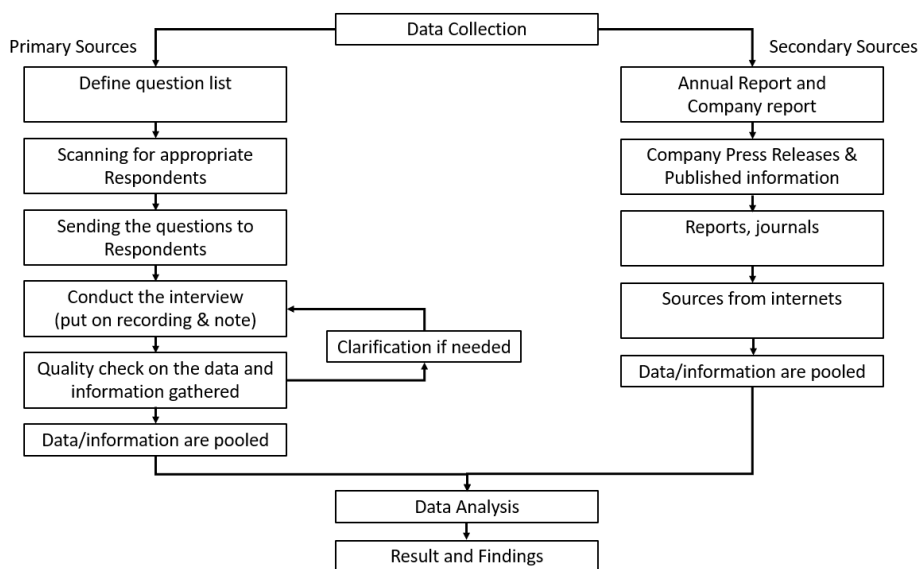


Fig. 9. Methodology to collect data and information.

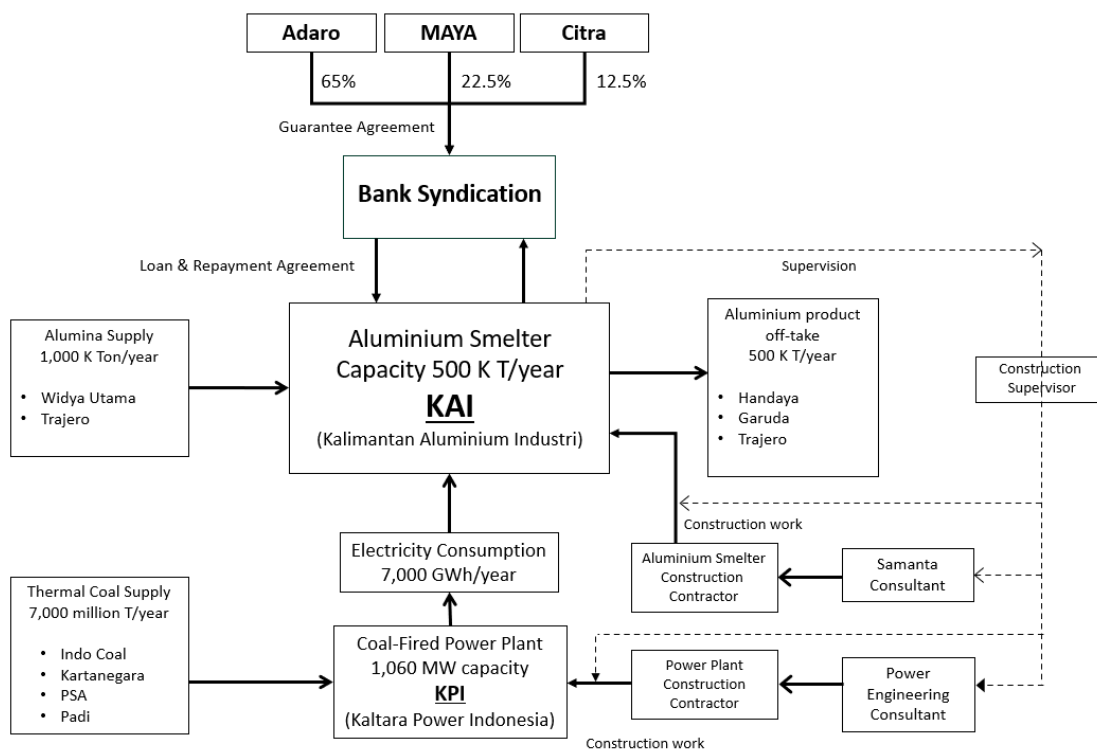


Fig. 10. Input-output diagram of the PT KAI, the Special Purpose Company.

## V. RESULTS

This section begins with the findings on the Input-Output diagram of the PT Kalimantan Aluminium Industry (KAI), as a Special Purpose Company (SPC), as shown in Fig 10.

The explanation for the Input-Output diagram of the PT KAI, the Special Purpose Company, is as follows.

### A. Project Structure

To deal with the construction and later with the operation of the Aluminium Smelter plant, Adaro, Maya and Citra Invest, set up a Special Purpose Company (SPC) so-called PT Kalimantan Aluminium Industry (KAI) with a shareholding of 65% (Adaro), 22.5% (Maya) and 12.5% Citra Invest (Adaro 2022 Annual Report, 2023, p. 96)

### B. Project Funding

The project is funded through Corporate Financing, with each shareholder's guarantee proportionate to their shareholding.

### C. Project Site

The plant is being constructed in the Kalimantan Industrial Park Indonesia (KIPI), situated in North Kalimantan, and spanning 600 hectares of land (Adaro 2022 Annual Report, 2023, p.95). The site is equipped with a jetty that serves the dual purpose of loading the finished goods and unloading the raw materials and coal.

### D. Electricity Supply

During the initial phase, which involves a Smelter capacity of 500,000 T/year, electricity will be supplied by a Coal-Fired Power Plant (CFPP). The construction and operation of the CFPP are overseen by PT Kaltara Power Indonesia (KPI) a separate entity from KAI. For using the electricity, KAI will be charged for the rent and lease of the coal-fired power plant equipment and its building and KAI will also be charged for the O&M service run by PT KPI.

### E. Coal Supply

The Coal Fired Power Plant utilizes advanced Super Critical Steam technology and relies on low/medium-rank coal as its primary fuel source. To fulfil this demand, Coal Supply Agreements (CSAs) have been established with several companies, including Indo Coal, Kartanegara, PSA, and Padi.

### F. Alumina Supply

The requirement is going to be supplied by Widya Utama who is a subsidiary of PT Citra Invest also a shareholder of KAI, and Trajero. The Alumina Supply Agreement has been established between KAI and them.

### G. Product Off-taker

The selling of Aluminium products has been secured with three major customers: Handaya, Garuda, and Trajero. Handaya will specifically utilize these Aluminium products for car manufacturing, particularly for electric vehicles. Garuda and Trajero are renowned international companies involved in the manufacturing and trading of Aluminium products worldwide.

## H. Construction Work

Maya is a prominent shareholder who is a leading company involved in producing and trading Nickel products. To oversee the design and supervision of the Aluminium Smelter plant, Maya will enlist the service of Samanta as a consultant. Samanta brings valuable experience from constructing several Aluminium Smelter plants in China. The construction of the power plant will be treated as a separate project from the Aluminium Smelter. The technology utilized in the Coal-Fired Power Plant is standardized and has witnessed limited changes. Given Adaro's extensive experience in constructing even larger power plants, they will take the lead in constructing the Coal-Fired Power Plant (CFPP). KAI will also engage Power Engineering as a Consultant.

### I. Operation and Maintenance (O&M)

The Operation and Maintenance activities will be carried out by the Kalimantan Aluminium Industry (KAI) team itself. The process begins with the recruitment of employees who are suitable for the job they will be doing, followed by training. Approximately 2,500 employees are needed, including those to serve the Coal Fired Power Plant unit. Initially, technical experts from Maya/China will be placed in leading technical positions. Afterwards, a knowledge transfer from these foreign experts to local staff is planned, so that after 3 years of operation, the number of foreign personnel in the technical department will be reduced to a few.

Table III compares the Ideal Condition vs. the Existing Condition following Michael Porter's Five Forces theory. The result identifies Enhancement Needed (EN) or No Enhancement Needed (N).

Table IV compares the Ideal Condition vs. the Existing Condition following the PESTLE theory. The result identifies Enhancement Needed (EN) or No Enhancement Needed (N).

Table V compares the Ideal Condition vs. the Existing Condition following the Organization Change Management theory. The result identifies Enhancement Needed (EN) or No Enhancement Needed (N).

Table VI is the proposed Enhancement for Adaro's Transformation Strategy and the Proposed Action.

## VII. CONCLUSION

The decision of Adaro Energy Indonesia to diversify its business through the establishment of an Aluminium Smelter business is a strategic move. Adaro's entrepreneurial mindset enables them to swiftly seize the opportunities presented by the Aluminium Smelter industry.

The presence of extensive industrial areas in North Kalimantan, particularly relatively near the Kayan River, offers opportunities for the construction of large-scale hydropower facilities. However, the lengthy construction timeline of over eight years for such projects could result in a significant loss of momentum if Aluminium Smelter plant operations were postponed until the infrastructure was ready. Hence, adopting coal-fired power plants initially for Aluminium production, with a transition to hydropower in the future, presents a viable strategy.

The purpose of this research is to enhance Adaro's transformation strategy for the new Aluminium Smelter

project by identifying any missing components in the strategy. Through analysis that uses Michael Porter's Five

Forces theory, PESTLE theory, and Organization Change Management theory define the Ideal conditions for Adaro's Transformation strategy to diversify its business in the Aluminium Smelter business. The research also analyzes the existing condition of Adaro in the Transformation strategy using SWOT theory and Resource-Based View (RBV) theory. Comparing the ideal condition and the existing condition, this research identifies the enhancement that is

proposed to be added to the existing Transformation strategy. From this analysis, the research suggests 15 (fifteen) enhancements as seen in Table VI, Enhancement of Adaro's Transformation Strategy, and the Proposed Action. The author is confident if this enhancement is integrated into the existing Transformation Strategy, it will render it comprehensive and greatly contribute to the successful completion of the project.

TABLE III: EN/N ANALYSIS FROM MICHAEL PORTER'S FIVE FORCES

Category	No	Ideal condition	AEI existing condition	EN/N
The threat of new entrants	1.	The new set-up of an Aluminium Smelter plant business requires High Capital Investment.	AEI is taking a leading position to obtain USD 2.1 billion in Corporate Finance for the construction of the Aluminium Smelter project.	N
	2.	The new Aluminium Smelter business requires Economies of scale.	Yearly production is estimated at 500,000 T/year. This is quite a sizeable volume for a business.	N
	3.	The new Aluminium Smelter business requires a feasible Demand-Supply ratio.	Aluminium domestic demand in 2022 is estimated at 1 million Tons per year while the current supply from INALUM is around 260,000 Tons per year. Hence there is so much opportunity to supply Aluminium products.	N
	4.	To enter the Aluminium Smelter business requires cumulative experience.	As AEI has no experience in the Aluminium Smelter business in the past, AEI is to partner with Maya as a leading partner in technology.	EN
	5.	Setting up a new Aluminium Smelter plant requires a supportive Government Policy.	The Government is very supportive of the project because of: 1. Local demand is greater than supply. 2. In June 2023, the Government issued an export ban regulation for Bauxite ore, the raw material used for Alumina. Alumina is used to produce Aluminium. 3. The Value Added of Bauxite to Aluminium products is 13 times.	N
Bargaining power of buyers	6.	The Aluminium business is influenced by the number of customers.	Aluminium Domestic Demand is much higher compared to Supply. The big three customers namely Handaya Car, Garuda, and Trajero have been engaged to take the product for both domestic and export.	N
	7.	The Aluminium business is price-sensitive	The electricity required for the Aluminium Smelter is supplied by CFPP and costs more than the electricity cost from hydropower.	EN
	8.	The differences between competitor	INALUM, the local competitor, has a capacity of 260,000 Tons/year, almost half of AEI's Aluminium Smelter plant. They have been running for more than 40 years for which the plant is almost fully depreciated. Further, for the electrolysis process, INALUM uses electricity from hydropower and the electricity cost is less than from a coal-fired power plant.	EN
The threat of substitute products	9.	Organization readiness in Marketing and Sales Structure for Aluminium Products.	Needs to develop Marketing and sales organization to handle the Aluminium products.	EN
	10.	Is there a substitute for Aluminium products?	Aluminium is used in many industries and home appliances. Examples of them are cable, the car industry, aircraft, building and many others. From many aspects, the use of Aluminium cannot just be replaced with other materials.	N
Bargaining power of suppliers	11.	Relative price performance, perceived level of product differentiation, switching cost to the non-Aluminium product	As mentioned in point 10 above, in some cases the use of Aluminium cannot be substituted by other materials, hence this specific checklist no 11 is not applicable.	N
	12.	The number and size of Alumina suppliers.	The supply of Alumina, the main material used in Aluminium Smelter, has been arranged with local suppliers Widya Utama and Trajero. Further, one of Widya Utama's shareholders is Citra Invest is also one of the shareholders in this Aluminium Smelter plant Special Purpose Company i.e., PT Kalimantan Aluminium Industry (KAI).	N
Rivalry among existing competitors	13.	The Supply Chain Management for Alumina and other raw material	Need to develop and establish Supply Chain Management for Alumina and other raw materials.	EN
	14.	The number of Aluminium Smelter plants.	Globally, there are many Aluminium Smelter plants to supply the world's demand. However, so far the demand is still above the supply. Aluminium domestic demand is estimated at 1 million Tons per year and is currently supplied by INALUM with a capacity of 260,000 Tons per year.	N
	15.	The industry growth	Electric vehicles (EVs) use Aluminium products a lot as the Aluminium characteristics are rigid but lighter compared to steel. Development and growth of electric vehicles are anticipated to keep going, hence Aluminium demand keeps rising.	N
	16.	Barriers to exit	Once the Aluminium Smelter plant has been set up, it will continue to operate UNLESS there is a major issue with the operation and its business. Therefore, barriers to exit are HIGH.	N
	17.	Variable Quality difference and Switching costs	This does not apply to Aluminium products and Aluminium Smelter plants.	N

TABLE IV: EN/N ANALYSIS FROM THE PESTLE

Category	No	Ideal condition	AEI existing condition	EN/N
Political factors	1.	Government support.	The government is very supportive of the Aluminium Smelter project as the local demand is still higher than the local supply.	N
	2.	Regulation on Raw Material Export.	Starting in June 2023, the Government of Indonesia (GOI) stopped the export of bauxite, the raw material for Alumina. Hence setting up a new Aluminium Smelter is in line with GOI policy.	N
	3.	Changing government in the year 2024.	This Aluminium Smelter plant should have no issue with GOI changing because of: 1. The new Aluminium Smelter plant is a pure PRIVATE project. 2. The project brings many benefits to the country. 3. This project aligns with the government's policy, which aims to promote the downstream of natural resources.	N
Economic factors	4.	To secure the project funding.	The investment cost of this project is approximately USD 2.1 billion. Because of some rigid/inflexible requirements from the lender, the project preferred to adopt Corporate Financing instead of Project Financing. With this condition, tight control must be applied to avoid unnecessary project cost increases.	EN
	5.	To secure the economics of the Aluminium Smelter Project for AEI.	The Aluminium Smelter project is very sensitive to Aluminium's global market price. To overcome this problem, keeping the Production cost under control and aiming at the lowest cost possible is crucial.	EN
Social factors	6.	To deal with Social Factors in general.	This Aluminium Smelter project is creating employment both during construction work and during operation. This is a positive image for AEI.	N
	7.	Objection from NGOs for the Aluminium Smelter project.	Some NGOs see the Aluminium Smelter project from a negative perspective because of the use of temporary coal-fired power plants for the Aluminium Smelter plant. Also, temporarily many contractors and workers come from China.	EN
Technological factor	8.	The technology used in Aluminium Smelters.	Maya and Citra Invest are AEI business partners. They are familiar and experienced with the technology used in the Smelter operation. In the author's opinion, AEI should define and create a program to equip themselves with Technology in Aluminium Smelter.	EN
	9.	Technology development in Electric Vehicle (EV)	Development in Electric vehicles keeps going rapidly, especially in China and Korea. This is an opportunity for the Aluminium Smelter project to be part of.	N
Legal factor	10.	Regulations that may impact in setting up of a new Aluminium Smelter plant	By June 2023, the export of Bauxite, the raw material for Alumina, is banned. This will encourage the new set-up of the Aluminium Smelter project.	N
	11.	The current license of Adaro Indonesia to mine the coal will expire in 2042 and it may not be extended.	AEI is committed to growing the business beyond thermal coal. By the year 2050, the contribution from thermal coal will be very limited. This encourages the development of Aluminium Smelter plants.	N
Environmental factor	12.	Aluminium is globally supported for green economy products, one of them being the Electric Vehicles component.	From the Aluminium product point of view, this is good for the Aluminium Smelter Project. However, the use of coal-fired power plants is creating a loud noise.	EN

TABLE V: EN/N ANALYSIS FROM ORGANIZATION CHANGE MANAGEMENT

Category	No	Ideal condition	AEI existing condition	EN/N
Refining the transformation strategy	1.	Clarifying the vision and goals for AEI's diversification efforts Identifying specific objectives and milestones for the Aluminium Smelter Project Defining key performance indicators (KPIs) to measure success.	The Adaro General Transformation Strategy has been set up to deal with the new Aluminium Smelter Project. This existing Transformation Strategy can still be enhanced further to make it better and to avoid unnecessary negative issues during the execution.	EN
Resource allocation and investment planning	2.	Assessing the financial requirements of the Aluminium Smelter Project Allocating resources effectively across different aspects of the project Identifying potential sources of funding and investment opportunities	Resource Allocation and Investment Planning were prepared even when the new Aluminium Smelter Project was initially in place. However, along the way, the condition and project environment has changed and therefore it is advisable to relook at the existing planning and modify it with the necessary enhancement.	EN
Technological advancement and operational excellence	3.	Evaluating the Technological Requirements for the Aluminium Smelter Project Assessing the existing capabilities and infrastructure of AEI Identifying areas for technological advancements and operational excellence improvements	Technology and operational excellence will be led by the business partner who has extensive experience in the Aluminium Smelter plant. Yet, the author believes that Adaro still has to develop the technology and operational excellence on its own, especially since AEI holds a 65% shareholding. This area can be enhanced further to strengthen Adaro's position.	EN
Stakeholder engagement and partnership	4.	Analyzing the key stakeholders and their roles in the diversification process Developing a stakeholder engagement plan to gain support and collaboration.	Stakeholder Engagement and Partnership evaluation was done even before the new Aluminium Smelter project was established. However, along the way, the situation, condition and project environment may change, and the Author believes that the	EN



Category	No	Ideal condition	AEI existing condition	EN/N
		Exploring potential strategic partnerships and alliances to strengthen AEI's position.	Transformation Strategy in this area still needs to be looked at and enhanced.	
Change management and organizational alignment	5.	Assessing the impact of the diversification on AEI's organizational structure Implementing change management strategies to support the transformation. Aligning the organizational culture and capabilities with the new business direction	To get the Transformation Strategy and execution of the new Aluminium Smelter project to run smoothly, a plan for Change Management and Organizational Alignment needs to be established.	EN
Risk management and mitigation	6.	Identifying potential risks and challenges associated with diversification. Developing risk mitigation strategies and contingency plans Regular monitoring and reassessment of risks throughout the process	There are many unpredictable and unforeseen matters in the execution of the new Aluminium Smelter project, especially since this is a new area that Adaro has never been there before. Therefore, it is recommended to establish a thorough Risk Management and Mitigation Plan.	EN
Monitoring, evaluation, and adaptation	7.	Establishing a monitoring and evaluation framework for the transformation strategy Regularly tracking progress against KPIs and milestones Incorporating flexibility and adaptability to adjust the strategy as needed.	The existing Transformation Strategy has included the monitoring of the new Aluminium Smelter project. This existing strategy, however, can be further enhanced with the concept of Monitoring, Evaluation, and Adaptation.	EN

TABLE VI: ENHANCEMENT OF ADARO'S TRANSFORMATION STRATEGY AND THE PROPOSED ACTION

Category	No	Ideal condition	Proposed Action	Proposed By
Organizational Change Management	1.	To refine the existing Transformation Strategy.	To refine the existing Adaro Transformation Strategy for the Aluminium Smelter project, including the following: – Clarifying the vision and goals for AEI's diversification efforts, – Identifying specific objectives and milestones for the Aluminium Smelter Project, – Defining key performance indicators (KPIs) to measure success.	PT AMI Tbk.
	2.	To refine the existing Resource Allocation and Investment Planning.	To refine the existing Resource Allocation and Investment Planning, including the following: – Assessing the Financial Requirements of the Aluminium Smelter Project, – Allocating resources effectively across different aspects of the project, – Identifying potential sources of Funding and Investment opportunities.	PT AEI Tbk.
	3.	To acquire Technological Advancement and Operational Excellence knowledge.	To define and execute the concept of Technological Advancements and Operational Excellence, including the following: – Evaluating the technological requirements for the Aluminium Smelter Project, – Assessing the existing capabilities and infrastructure of AEI, – Identifying areas for technological advancements and operational improvements.	PT KAI + PT AEI Tbk.
	4.	To refine Stakeholder Engagement and Partnerships.	To define and execute the concept of Stakeholder Engagement and Partnerships, including the following: – Analyzing the key stakeholders and their roles in the diversification process, – Developing a stakeholder engagement plan to gain support and collaboration, – Exploring potential strategic partnerships and alliances to strengthen AEI's position.	PT AMI Tbk.
	5.	To set up Change Management and Organizational Alignment.	To define and execute the concept of Change Management and Organizational Alignment, including the following: – Assessing the impact of the diversification on AEI's organizational structure, – Implementing change management strategies to support the transformation, – Aligning the organizational culture and capabilities with the new business direction.	PT AEI Tbk.
	6.	To do Risk Management and Mitigation.	To define and execute the concept of Risk Management and Mitigation, including the following: – Identifying potential risks and challenges associated with the diversification of the Aluminium Smelter project, – Developing risk mitigation strategies and contingency plans, – Regular monitoring and reassessment of risks throughout the process.	PT KAI
	7.	To do Monitoring, Evaluation, and Adaptation.	To define and execute the concept of Monitoring, Evaluation, and Adaptation, including the following: – Establishing a monitoring and evaluation framework for the transformation strategy, – Regularly tracking progress against KPIs and milestones,	PT KAI

Category	No	Ideal condition	Proposed Action	Proposed By
Michael Porter's Five Forces	8.	To enter the Aluminium Smelter business requires cumulative experience.	<ul style="list-style-type: none"> <li>– Incorporating flexibility and adaptability to adjust the strategy as needed.</li> </ul> To build operational experience in an Aluminium Smelter Plant, including the following: <ul style="list-style-type: none"> <li>– To appoint an experienced consultant/advisor who has a deep understanding and experience in the operation of the Aluminium Smelter Plant,</li> <li>– To establish a Knowledge Management Centre.</li> </ul>	PT KAI + PT AEI Tbk.
	9.	The Aluminium business is price sensitive.	To build the knowhow on Aluminium Smelter Plant Operation, including the following: <ul style="list-style-type: none"> <li>– To get a deep understanding of the cost structure of making Aluminium in the Aluminium Smelter plant,</li> <li>– Capitalize on the benefit of the Supply Chain Management application.</li> </ul>	PT KAI
	10.	To manage the differences between competitors.	To create and execute a roadmap to become the most competitive Aluminium producer, including the following: <ul style="list-style-type: none"> <li>– Know your competitor,</li> <li>– Know our strengths and weaknesses.</li> </ul>	PT KAI
	11.	To prepare for organization readiness in Marketing and Sales for Aluminium Products.	To set up a Marketing and Sales team dedicated to Aluminium products.	PT AMI Tbk.
	12.	To prepare for Supply Chain Management for Alumina and other raw materials.	To adopt the concept of PLAN, SOURCE, MAKE, DELIVER in the Supply Chain Management system for the Aluminium Smelter business.	PT AMI Tbk.
	13.	To prepare for Project Funding.	The proposed action is identical to No. 2 above.	PT AEI Tbk.
PESTLE analysis	14.	To make sure the Economics of the Aluminium Smelter Project for AEI is under control.	To define and execute a strategy to secure the economics of the Aluminium Smelter project, including the following: <ul style="list-style-type: none"> <li>– To continue analyzing the forward Aluminium global price,</li> <li>– To get a deep understanding of the cost structure of producing Aluminium from an Aluminium Smelter plant,</li> </ul> Capitalize on the benefit of the Supply Chain Management application.	PT KAI
	15.	To handle objections from NGOs	To set up and execute a strategy to handle negative NGOs, including the following: <ul style="list-style-type: none"> <li>– Strategic communication to balance the negative perception created by NGOs,</li> <li>– Positive campaign for the benefit of Aluminium Smelter plants for the country, nations, and people.</li> </ul>	PT AMI Tbk.
	16.	To equip the organization with the technology know-how used in Aluminium Smelter.	The proposed action is identical to No. 3 above.	PT AEI Tbk.
	17.	Producing Aluminium is globally supported because it provides green economy products. One of them is Electric vehicles. The only discouragement is because of the use of a Coal-Fired Power Plant.	To define and execute a Strategic communication to balance the adverse perception of the Adaro Aluminium Smelter project in using a "temporary" Coal-Fired Power Plant before the Hydropower plant is ready.	PT AMI Tbk.

### VIII. IMPLEMENTATION PLAN

The implementation plan shown in Fig. 11 below is the suggestion from the author. Details of the plan and criteria of each step must be discussed, detailed, and agreed with the management. The construction of the Aluminium Smelter plant is expected to be completed by mid-2025 and fully operational in Q3/2025.

### CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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